Sweet Temptations

van 't Jagt, Ruth Koops; Hoeks, John C. J.; Duizer, Evelien; Baron, Melvin; Molina, Gregory B.; Unger, Jennifer B.; Jansen, Carel J. M.

Published in:
Health Communication

DOI:
10.1080/10410236.2016.1258617

Publication date:
2018

Health Communication

ISSN: 1041-0236 (Print) 1532-7027 (Online) Journal homepage: http://www.tandfonline.com/loi/hhth20

Sweet Temptations: How Does Reading a Fotonovela About Diabetes Affect Dutch Adults with Different Levels of Literacy?

Ruth Koops van 't Jagt, John C. J. Hoeks, Evelien Duizer, Melvin Baron, Gregory B. Molina, Jennifer B. Unger & Carel J. M. Jansen

To cite this article: Ruth Koops van 't Jagt, John C. J. Hoeks, Evelien Duizer, Melvin Baron, Gregory B. Molina, Jennifer B. Unger & Carel J. M. Jansen (2017): Sweet Temptations: How Does Reading a Fotonovela About Diabetes Affect Dutch Adults with Different Levels of Literacy?, Health Communication, DOI: 10.1080/10410236.2016.1258617

To link to this article: http://dx.doi.org/10.1080/10410236.2016.1258617

HEALTH COMMUNICATION
http://dx.doi.org/10.1080/10410236.2016.1258617

Routledge
Taylor & Francis Group

Sweet Temptations: How Does Reading a Fotonovela About Diabetes Affect Dutch Adults with Different Levels of Literacy?

Ruth Koops van 't Jagt [a], John C. J. Hoeks [a], Evelien Duizer [a], Melvin Baron [b], Gregory B. Molina [b], Jennifer B. Unger [b], and Carel J. M. Jansen [a,c]

[a]Department of Communication and Information Sciences, University of Groningen; [b]School of Pharmacy, University of Southern California; [c]Language Centre, Stellenbosch University

ABSTRACT

Recent studies suggest that health-related fotonovelas—booklets that portray a dramatic story using photographs and captions—may be effective health communication tools, especially for readers with a low level of literacy. In this experiment, effects on knowledge and behavioral intentions were assessed of a fotonovela originally developed for a Latin-American audience. Dutch readers from a low literacy group ($N = 89$) and a high literacy group ($N = 113$) were randomly assigned to one of three conditions: a fotonovela condition (all captions translated into Dutch), a traditional brochure condition (also in Dutch), and a control condition. On knowledge about diabetes, participants in the fotonovela condition outperformed participants in both other conditions. This finding was consistent across literacy levels. On behavioral intentions, however, readers of the fotonovela did not score significantly higher than participants in the other conditions. We also evaluated hypotheses proposed in the Entertainment Overcoming Resistance Model (EORM; Moyer-Gusé, 2008) on the possible mechanisms underlying persuasion through narratives. No support was found for the mechanisms proposed in the EORM. The outcomes of this study suggest that a fotonovela may be a valuable health education format for adults with varying levels of literacy, even if it was developed for a target group with a different cultural background.

Introduction

In the Netherlands, 12% of the population between 16 and 65 years have low literacy skills (Buisman, Allen, Fouarge, Houtkoop, & Van der Velden, 2013, p. 29), preventing these citizens from using written information to function adequately in society (White & Dillow, 2005, p. 4). Literacy skills are closely related to health literacy. Parker, Baker, Williams, and Nurss (1995) found high correlations among measures of general literacy skills (WRAT-R), literacy in medicine (REALM), and functional health literacy (TOFHLA).[1] Both low literacy and low health literacy have been reliably associated with poor health outcomes such as poorer health knowledge, poor overall health status, measures of morbidity, and use of health resources (DeWalt, Berkman, Sheridan, Lohr, & Pignone, 2004; Geboers, Reijneveld, Jansen, & De Winter, 2016).

One of the reasons that people may experience health problems is that it can be difficult to read and understand written health information such as patient leaflets and package inserts. This would suggest that forms of communication that do not rely on written language may be more effective. Indeed, a systematic review on the effectiveness of health-related documents revealed that providing information in visual narratives is a promising strategy for delivering health messages (Koops van 't Jagt, Hoeks, Jansen, De Winter, & Reijneveld, 2016). In the present study, we investigated the possible benefits of using a specific form of visual narrative, the *fotonovela*, as a strategy to reach an audience with low levels of literacy. Fotonovelas—small booklets portraying a dramatic story with photographs and captions—may engage audiences with realistic characters, simple texts, and vivid pictures. Fotonovelas have been successfully used as health communication and education tools in countries like the United States, Mexico, and South Africa (e.g., Boyte, Pilisuk, Matiella, & Macario, 2014; James et al., 2005; Unger, Cabassa, Molina, Contreras, & Baron, 2013; Unger, Molina, & Baron, 2009). This educational use of fotonovelas fits in with a long-standing tradition of entertainment education and narrative-based strategies (e.g., Singhal, Njogu, Bouman, & Elias, 2006; Singhal & Rogers, 1988). Narrative-based health communication may facilitate processing, may increase motivation to accept the main message and act on it because of reduced resistance, can be viewed as a form of learning through experience, and can contribute to changes in attitudes, intentions, and behavior (Fransen, Smit, & Verlegh, 2015; Glaser, Garsoffky, & Schwan, 2009; Hinyard & Kreuter, 2007; Mar & Oatley, 2008; Moyer-Gusé, 2008; Schank & Abelson, 1977, 1995; Zabrucky & Moore, 1999).

The fotonovela used in this study was about type 2 diabetes. In the Netherlands, as in the United States, type 2

CONTACT Ruth Koops van 't Jagt r.koops.van.t.jagt@rug.nl Department of Communication and Information Sciences, Faculty of Arts, University of Groningen, P.O. Box 716, 9700 AS, Groningen, The Netherlands.

diabetes is especially prevalent in adults with low literacy: 5.6% in the lowest literacy group suffer from type 2 diabetes versus 1.2% in the highest literacy group (Gezondheidsraad, 2011, p. 9). Consequences of diabetes are also more severe for adults with low levels of literacy (Schillinger et al., 2002).

In the last decade, a limited number of studies have explored possible effects of fotonovelas as a means to communicate health education messages. Unger et al. (2009), for instance, developed a bilingual fotonovela on diabetes (*Sweet Temptations*) which was evaluated among 311 Hispanic adults with low literacy in California. In a pretest–posttest study, they found that diabetes knowledge increased significantly after reading the fotonovela. Furthermore, they found that the participants' intentions to exercise, eat fruit and vegetables, and talk to a family member were significantly higher than before the participants read the fotonovela.

Unger et al. (2013) tested the effects of a fotonovela on depression. In both the fotonovela condition and a control condition with a traditional brochure, an immediate posttest and also a follow-up test after 1 month showed a statistically significant knowledge gain. Only in the fotonovela condition, however, the stigma regarding people with a depression was significantly reduced. Boyte et al. (2014) evaluated a fotonovela to encourage human papillomavirus immunization among preteens in California. In an experiment without a control group, a statistically significant knowledge gain was found from pretest to posttest. James et al. (2005) evaluated the effects of a South African fotonovela on sexually transmitted infections. Knowledge scores of the participants who read the fotonovela significantly improved both in an immediate posttest and in a follow-up test taken after 6 weeks, as compared to a pretest as well as to a control group. Similar results were found for attitudes and behavioral intentions concerning prevention measures.

According to Kreuter et al. (2005), it is a truism that health promotion messages will be more effective if they reflect cultural norms, values, and beliefs. However, the authors remark that "evidence to support this notion is surprisingly limited" (p. 53). Larkey and Hecht (2010) also regard culturally grounded narratives as a natural choice for creating health messages for specific audiences, pointing out that many health promotion campaigns include interventions based on the assumption that in order to be effective, the messages should incorporate culturally relevant content. Just as Kreuter et al. (2005), however, Larkey and Hecht remark that hardly any studies have tested whether such approaches are indeed more effective than programs that ignore culture (pp. 113, 114). Although recent systematic reviews tested the persuasive effects of narratives (Braddock & Dillard, 2016; De Graaf, Sanders, & Hoeken, 2016) and other systematic reviews evaluated the effectiveness of behavioral interventions with culturally adapted strategies (Kong, Tussing-Humphreys, Odoms-Young, Stolley, & Fitzgibbon, 2014; Nierkens et al., 2013), only a few empirical studies have actually evaluated the effects that educational narratives that are culturally targeted to one group may have on other cultural groups (see for example Murphy et al., 2015, who explored the effects of a cervical cancer film developed for Mexican Americans on other ethnic groups). To our knowledge, for fotonovelas, such effects have not yet been studied empirically at all.

If existing fotonovelas translated into various languages could be successfully used as health education tools in multiple cultures, it would reduce the urgency of creating separate fotonovelas for each cultural group. Furthermore, if the effects of reading a fotonovela are found to be positive both for readers with a high level of literacy and for readers with a low level of literacy, no measures regarding a specific target group would have to be taken when distributing this fotonovela. For these reasons, the present study aimed to test the effects of reading a translated version of the fotonovela *Sweet Temptations* (Unger et al., 2009) in people with varying levels of literacy in the Netherlands. The title was literally translated into *Zoete verleiding*, and all captions were translated into Dutch. The story line was unchanged. All pictures were copied from the original version.

In addition to investigating the effectiveness of the fotonovela *Zoete verleiding*, we wanted to explore how possible effects of reading this fotonovela on behavioral intentions could be explained. The last few decades have witnessed a considerable increase in theoretical and empirical studies into possible explanations for the persuasiveness of messages presented in various narrative formats (see, for instance, De Graaf, Hoeken, Sanders, & Beentjes, 2012; Green & Brock, 2000, 2002; Hinyard & Kreuter, 2007; Hoeken & Sinkeldam, 2014; Slater & Rouner, 2002). The present study examined the explanatory potency of the *Entertainment Overcoming Resistance Model* (EORM) for the processing and the persuasive effects of a fotonovela.

The EORM

The EORM, developed by Moyer-Gusé (Moyer-Gusé, 2008; Moyer-Gusé & Nabi, 2010), builds on Bandura's social cognitive theory (Bandura, 2002) and Slater and Rouner's *Extended Elaboration Likelihood Model* (2002). The EORM lists a number of entertainment features positively affecting the adoption of story-consistent attitudes and behaviors, through reduction in initial resistance against perceived pressure to behavior change. Important roles in this process are played by *transportation, identification*, and *perceived similarity*.

Transportation refers to the process by which an individual becomes immersed into the story, losing track of the real world as he or she experiences the unfolding events in the story (Moyer-Gusé & Nabi, 2010, p. 29). Other labels used for this phenomenon of being swept into the story are *absorption* (Slater & Rouner, 2002), *narrative involvement* (Moyer-Gusé & Nabi, 2010), and *narrative engagement* (Busselle & Bilandzic, 2008).

Identification is defined in the EORM as an emotional and cognitive process, whereby a viewer imagines himself or herself as a particular character. This process involves sharing feelings of the character, sharing his/her perspective, internalizing his/her goals, and losing self-awareness during exposure. Losing self-awareness overlaps with transportation. However, whereas identification involves taking the perspective of a particular character, transportation does not require this kind of perspective taking: Readers, viewers, or listeners may become swept up in an imaginary world while maintaining their own perspective (Moyer-Gusé & Nabi, 2010, pp. 29–30).

Perceived similarity is another important concept in narrative persuasion (Moyer-Gusé & Nabi, 2010, p. 30). It is understood as the viewer's judgment about the extent to which he or she and a character share common attributes, characteristics, beliefs, and/or values. Perceived similarity may influence the extent to which readers identify with characters in a story, but it is not the same. Even without having anything in common with a specific character, readers, viewers, and listeners may readily identify with him/her and experience the fictitious events as if they happened to themselves (Moyer-Gusé, 2008, p. 410; Moyer-Gusé & Nabi, 2010, pp. 29–30).

According to the EORM, transportation reduces motivation and ability to *counterargue* the persuasive message embedded in the story, because the audience members do not want to interrupt the enjoyable and immersive process of being transferred to another world. Identification is also assumed to reduce counterarguing. Identification favors adopting the thoughts and feelings of a character instead of criticizing them. Furthermore, both identification and perceived similarity are expected to increase *perceived vulnerability*, by contesting the reader's belief that he/she is uniquely immune to negative consequences, regardless of risky behavior (Moyer-Gusé & Nabi, 2010, pp. 30–32).

Goals of this Study

The present study evaluated the effects of reading *Zoete verleiding*, a Dutch translation of the fotonovela *Sweet Temptations*, on diabetes knowledge, and behavioral intentions among Dutch adults with different levels of literacy. Furthermore, the mechanisms proposed in the EORM that could underlie possible persuasive effects were explored.

Methods

Participants

Two groups of participants were recruited based on level of literacy. Participants in the low literacy group took part in literacy courses or in literacy meetings organized throughout the Netherlands. Participants in the high literacy group were recruited among family members or acquaintances by students who took part in a course on Persuasive Health Communication at the University of Groningen. Participants from both groups were randomly assigned to one of three conditions. In one condition, participants read *Zoete verleiding* and filled out a questionnaire. In another condition, participants read a traditional health brochure on diabetes developed on the basis of a content analysis of the fotonovela and filled out a similar questionnaire. In a control condition, participants just filled out the questionnaire.

As in earlier studies into the effects of health-related fotonovelas, explicit measures for level of literacy were not included. We assumed that literacy course members, contrary to the other participants, could be considered as individuals with a low level of literacy. In view of the association, however, between level of literacy and level of education (e.g., Schillinger, Barton, Karter, Wang, & Adler, 2006), five participants were excluded from the high literacy group since they reported that they had received no education, only primary school or lower vocational education. Three other participants, none of whom had Dutch as their mother tongue, were excluded from the low literacy group because they had received a form of higher education.

As a result, data from 202 participants were available for analysis: 89 in the low literacy group and 113 in the high literacy group. Comparing data collected in the different groups and conditions on age, gender, mother tongue (Dutch or not), and diabetes history (patient or not) revealed a significant age difference ($F(1, 198) = 13.29$; $p < .01$; $\eta^2 = .06$) between the low literacy group ($M = 48.08$; $SD = 12.68$) and the high literacy group ($M = 40.70$; $SD = 15.26$). Furthermore, a significant relationship was found between level of literacy and mother tongue: χ^2(corrected for continuity)(1) = 27.48; $p < .01$. In the low literacy group, 31.8% did not have Dutch as their mother tongue; in the high literacy group, this was 3.5%. There were no other significant differences between the two literacy groups or between the three conditions, except for level of education, which obviously differed between the two literacy groups.

Procedure

Participants in the low literacy group read the materials and filled out the questionnaires in the classrooms where the literacy courses were given. Each participant received a package containing the fotonovela plus a questionnaire, the brochure plus a questionnaire, or just a questionnaire. Participants in the fotonovela and the brochure condition were instructed to read the booklet first and then to fill out the questionnaire. Participants in the control condition were instructed to fill out the questionnaire immediately. Participants in the high literacy group were approached individually by students. The same procedure was followed, and the same materials were used as in the low literacy group.

Materials

Zoete verleiding is a close adaptation of *Sweet Temptations*, a fotonovela booklet (in Spanish and English) on a Hispanic family affected by diabetes. *Sweet Temptations* (Spanish title: *Tentaciones Dulces*) was developed by a team of diabetes experts, health educators, and researchers as a health education tool for Hispanic adults in the United States with lower levels of education (Unger et al., 2009). The story in *Sweet Temptations* is followed by a question and answer section, including small pictures from story characters. This specific section was not included in *Zoete verleiding*, however, in order to allow assessment of the persuasive effects of reading the story *per se*. For the purpose of the current study, all captions in *Sweet Temptations* were translated from English to Dutch, using a translation-back translation procedure. The names of the characters were changed into names that can also be found in the Netherlands. The pictures from *Sweet Temptations* were adopted without any changes.

Based on a content analysis of the fotonovela, a traditional brochure with a number of neutral illustrations was developed to include the same information about diabetes symptoms, prevention, and treatment. Layout and style were inspired by an existing diabetes brochure from the Dutch Diabetes Foundation.[2]

Measures

The questionnaire included items about demographic characteristics, diabetes knowledge, and behavioral intentions. Participants in the fotonovela condition also answered questions related to the EORM. To enable participants with low levels of literacy to answer the questions, the questionnaires included short and simple words and sentences, and icons (*smileys*) accompanying answer options. All questions, except those on diabetes knowledge, behavioral intentions, and perceived vulnerability (see below), were phrased as statements, with answer options on a 5-point scale (translated from Dutch: *Fully disagree; Disagree; Agree; Fully agree; Don't know*). In the data analysis, the first four options were scored as 1, 2, 4, and 5, respectively; *Don't know* was scored as 3.

Knowledge and Behavioral Intentions

Diabetes knowledge was measured with seven 3-choice ("yes", "no", "don't know") items assessing knowledge of facts included in the fotonovela and in the brochure. The items were adapted from items used in Unger et al. (2009). The following statements (translated here from Dutch) were presented: "People with diabetes may suffer from tiredness"; "Diabetes can lead to sexual problems"; "Diabetes can lead to heart problems"; "People who eat healthy run a higher risk of developing diabetes" (scores reversed); "People who are overweight run a higher risk of developing diabetes"; "People with diabetes have to regularly test their blood sugar"; and "Some people with diabetes have to take pills". Each answer was scored as 1 (correct) or 0 (incorrect or "don't know"). Knowledge scores could thus range from 0 to 7.

Behavioral intentions were assessed with five questions (translated here from Dutch), adapted from Unger et al. (2009): "In the next 6 months, do you think you will exercise for at least 30 minutes per day?" "In the next 6 months, do you think you will eat at least four servings of vegetables?" "In the next 6 months, do you think you will eat at least two portions of fruit?" "In the next 6 months, do you think you will talk to a doctor or pharmacist about your risk for diabetes?" "In the next 6 months, do you think you will talk to a family member or friend about how to prevent diabetes?" Answer options were presented on a 5-point scale, again accompanied by smileys: *No!; No I don't think so; Yes I think so; Yes!; and Don't know*. The first four options were scored as 1, 2, 4, and 5, respectively; *Don't know* was scored as 3. Because of content differences between the five intentions, the intention items were analyzed separately.

EORM Variables

In order not to overburden especially the low literacy group, items were included for only a selection of three EORM variables measuring entertainment features: transportation, identification, and perceived similarity, and two EORM variables related to these entertainment features: counterarguing and perceived vulnerability.

Transportation was measured with seven items adapted from Moyer-Gusé and Nabi (2010). "While I was reading the story, I only thought about what was being told in the story"; "While I was reading the story, my mind was with the story"; "After I finished the story, I found it difficult to put it out of my mind"; "While I was reading the story, I was interested how the story would end"; "The story touched my feelings"; "I found myself thinking of ways the story could have ended differently"; and "My mind wandered off while reading the story" (scores reversed) (α = .67).

Identification was measured with eight items adapted from Moyer-Gusé and Nabi (2010). Because these items refer to identification with one character, participants were asked to first select the character (X) with whom they felt most connected and then answer the identification items for this character. "I think I have a good understanding of *X*"; "I understand why *X* did what he/she did"; "While I was reading the story, I felt the emotions of *X*"; "At important moments in the story I knew exactly what *X* went through"; "I understood how *X* felt"; "While I was reading the story, I imagined myself doing the same things as *X*"; "While I was reading the story, it seemed like I was taking part in the story myself"; and "While I was reading the story, it felt like I was a friend of *X*" (α = .74).

Perceived similarity was measured with four items adapted from Moyer-Gusé and Nabi (2010). Just as for identification, these items were answered for the character with whom participants felt most connected. "*X* thinks in the same ways I do"; "*X* behaves in the same ways I do"; "*X* is similar to me"; and "*X* looks like me" (α = .85).

Counterarguing was measured with four items adapted from Moyer-Gusé and Nabi (2010). "While I was reading the story, I sometimes felt the urge to oppose the story"; "I agreed with what was being told in the story" (scores reversed); "While I was reading the story, I had the impression that part of the information was false or misleading"; "I was looking for mistakes in the story". Because Cronbach's alpha was unsatisfactory (α = .48, maximum), only the first item was included in our analyses, as this item best represented the concept of counterarguing.

Perceived vulnerability was measured with four items assessing participants' perceived risk of diabetes with their current lifestyle. The items were adapted from a study by Moyer-Gusé and Nabi on risks about unprotected sex (Moyer-Gusé & Nabi, 2010). "In general, how large is the risk you will develop diabetes yourself in the next five years?"; "If you don't eat healthy how large is the risk you will develop diabetes yourself?"; "If you don't exercise enough how large is the risk you will develop diabetes yourself?"; "If you don't lose weight how large is the risk you will develop diabetes yourself?" Answer options were presented as a 5-point scale, again accompanied by smileys: *Very large; Rather large; Rather small; Very small; and Don't know*. The first four options were scored as 1, 2, 4, and 5, respectively; *Don't know* was scored as 3 (α = .84).

Analyses

Analyses of variance were performed to detect significant effects of condition, literacy level, and possible interactions between these two variables on knowledge and behavioral intentions. To examine whether the EORM variables that were measured mediated the effects of the fotonovela on behavioral intentions and whether these effects were moderated by literacy level, mediation analyses were performed using Hayes' Process Tool (see Hayes, 2013, pp. 419–456).

Results 3

Effects on Diabetes Knowledge

A univariate analysis of variance was conducted on diabetes knowledge scores, with condition (fotonovela, brochure or control) and level of literacy (low or high) as independent variables. Gender, age, mother tongue (Dutch or not Dutch), and diabetes history (patient or not) served as covariates.

The main effect of level of literacy was significant (low literacy group: $M = 5.71$; $SD = 1.40$; high literacy group: $M = 6.25$; $SD = 1.03$), $F(1, 188) = 8.61$; $p < .01$; $\eta^2 = .04$, as was the main effect of condition (fotonovela: $M = 6.55$; $SD = 0.79$; brochure: $M = 6.26$; $SD = 1.06$; control condition: $M = 5.13$; $SD = 1.36$), $F(2, 188) = 33.04$; $p < .01$; $\eta^2 = .26$. There was no significant interaction effect of condition and level of literacy ($p = .11$), and none of the covariates had a significant effect. Follow-up analyses showed that participants who had read the fotonovela had significantly higher levels of diabetes knowledge than participants who had read the brochure, $F(1, 129) = 4.14$; $p = .04$; $\eta^2 = .03$ and participants from the control condition, $F(1, 124) = 59.88$; $p < .01$; $\eta^2 = .30$. Furthermore, participants who read the brochure outperformed participants in the control condition, $F(1, 119) = 28.89$; $p < .01$; $\eta^2 = .19$.

Effects on Behavioral Intentions

A multivariate analysis of variance was conducted with all five intention items as dependent variables, condition and level of literacy as independent variables, and gender, age, mother tongue, and diabetes history as covariates. Significant multivariate main effects were found of level of literacy ($F(5, 182) = 8.69$; $p < .01$; $\eta^2 = .19$) and of diabetes history ($F(5, 182) = 3.39$; $p < .01$; $\eta^2 = .08$). Neither a significant multivariate main effect of condition nor a significant multivariate interaction effect was found.

Follow-up univariate analyses of variance, again with gender, age, mother tongue, and diabetes history as covariates, revealed significant effects of level of literacy on intention to eat vegetables ($F(1, 186) = 9.23$; $p < .01$; $\eta^2 = .05$), on intention to eat fruit ($F(1, 186) = 9.63$; $p < .01$; $\eta^2 = .05$), on intention to talk with a doctor or pharmacist ($F(1, 186) = 26.62$; $p < .01$; $\eta^2 = .12$), and on intention to talk with family or friends ($F(1, 186) = 19.30$; $p < .01$; $\eta^2 = .09$). For each of these intentions, scores in the low literacy group were significantly higher than in the high literacy group. The covariate diabetes history significantly affected two intentions, intention to exercise ($F(1, 186) = 5.14$; $p = .02$; $\eta^2 = .03$) and intention to eat vegetables ($F(1, 186) = 4.56$; $p = .03$; $\eta^2 = .02$). For both intentions, scores in the group of diabetes patients were significantly lower than among non-patients.

Relations Between EORM Variables and Behavioral Intentions

Mediation analyses were performed to explore whether possible effects of the fotonovela on behavioral intentions could be explained by pathways proposed in the EORM. Using a *parallel multiple mediator model* (Hayes, 2013, pp. 125–130, 445), relationships were investigated between three predictors (transportation, identification, and perceived similarity), two possible mediators (counterarguing and perceived vulnerability) and five outcome variables, the behavioral intentions described above. In order to statistically control for potential alternative explanations (cf. Hoeken & Sinkeldam, 2014, p. 950), entertainment features that were not used as an independent variable served as covariates. No significant direct or indirect effects were found of any predictor via any mediator on any outcome variable. One significant and positive total effect (B = .69; $p = .03$) was found of the predictor *transportation* on one of the outcome variables: *intention to talk to a doctor or pharmacist*. When the analysis was repeated with level of literacy as a possible moderator (Hayes, 2013, pp. 245–250, 455), this variable was not found to significantly influence the total, direct, or indirect effects of transportation via counterarguing or perceived vulnerability on intention to talk to a doctor or pharmacist.

Discussion

This study was conducted to evaluate the effects of reading a Dutch translation of the fotonovela *Sweet Temptations* on diabetes knowledge and behavioral intentions among Dutch adults with different levels of literacy. For diabetes knowledge, participants who had read the fotonovela significantly outperformed participants who had read a traditional brochure, and participants who read either the fotonovela or the brochure significantly outperformed participants from the control condition. These findings were consistent across literacy levels. Readers of the fotonovela did not score significantly higher on behavioral intentions than participants in the other conditions, however.

A comparison between our outcomes and the findings from Unger et al. (2009) on the original fotonovela shows that in both studies, the fotonovela positively affected diabetes knowledge. In contrast to Unger et al. (2009), however, in the present study, no effects were found on behavioral intentions. It should be noted, though, that Unger et al. presented their participants not only with the narrative, but also with a question and answer section, referring to knowledge as well as beneficial behavior. As shown in Moyer-Gusé, Jain, and Chung (2012), the combination of an entertainment narrative with an explicit persuasive appeal in an epilogue may positively contribute to influencing health behavior. Possibly, including a question-and-answer section in *Zoete verleiding* would have strengthened its positive effects. Anecdotal evidence gathered during the present study suggests additional advantages of the fotonovela. Just as reported in Unger et al. (2013), participants often indicated that they wanted to take the fotonovela home in order to show it to friends and family members, thereby increasing its potential reach.

With regard to the possible mechanism underlying narrative persuasion, we found no evidence for the indirect effects predicted by the EORM. There was no support for the claim that higher levels of transportation, identification, and perceived similarity lead to stronger behavioral intentions via increased perceived vulnerability or via decreased levels of counterarguing. The only significant relation we found was a significant total effect of transportation on intention to talk to a doctor or pharmacist. This total

effect, however, did not entail a significant indirect effect via counterarguing or perceived vulnerability. More studies are necessary that explore other possible pathways to the outcomes of reading stories that include a health message.

In contrast to the assumption that in order to be effective, health promotion messages should always be tailored to the culture of the target group (Kreuter et al., 2005; Larkey & Hecht, 2010) and this study found that a fotonovela developed for a Latin-American audience with low literacy also had positive effects on health knowledge of Dutch adults with varying levels of literacy. An explanation may be that readers readily get captivated by a well-told story, even if it plays in a cultural context that greatly differs from the reader's own reality. Large numbers of fiction and nonfiction books, movies, and television series have become popular all over the world although they play in a time and place very different from the time and place of the readers and viewers. New studies are warranted that systematically evaluate the effects of adapting or not adapting health promotion narratives such as fotonovelas to the readers' cultural context.

This study is the first to test if the effectiveness of a fotonovela is dependent on the level of literacy. It was found that both readers with low and with high literacy learned more from a fotonovela compared to a traditional brochure, even though the fotonovela was developed for a target group with a different cultural background. The present study also is the first to empirically explore whether possible effects of reading the fotonovela might be explained by the pathways proposed in the EORM. No support for these pathways was found.

In this study, it was assumed that the division made between literacy course members and other readers reflects the distinction between people with low health literacy and people with high health literacy. In future studies, more explicit measures of health literacy could be included, as they did for instance in Meppelink, Smit, Buurman, and Van Weert (2015). These authors also found that materials adapted to low health literacy groups may be effective too for people with high health literacy and do not induce negative reactions (p. 1187).

In conclusion, the outcomes of this study suggest that a fotonovela may be a valuable health education format for adults with varying levels of literacy, even if it was developed for a target group with a different cultural background.

Notes

1. Parker et al. (1995) report the following correlations: r(TOFHLA, WRAT-R) = .74; r(TOFHLA, REALM) = .84 (p. 539).
2. Copies of the research materials, the questionnaires are available from the corresponding author, as are tables with detailed information on the demographic profiles of the participants in the various conditions and on the outcomes of the analyses of variance and the mediation analyses.
3. In Duizer, Koops van 't Jagt, and Jansen (2014), published in Dutch, results are reported for the low literacy group.

ORCID

Ruth Koops van 't Jagt http://orcid.org/0000-0001-9109-5559
John C. J. Hoeks http://orcid.org/0000-0002-6874-1126
Evelien Duizer http://orcid.org/0000-0002-9152-2378
Melvin Baron http://orcid.org/0000-0002-8694-4533
Gregory B. Molina http://orcid.org/0000-0002-4905-4670
Jennifer B. Unger http://orcid.org/0000-0001-9064-6603
Carel J. M. Jansen http://orcid.org/0000-0001-5259-4291

References

Bandura, A. (2002). Social cognitive theory in cultural context. *Applied Psychology: An International Review*, *51*, 269–290. doi:10.1111/apps.2002.51.issue-2

Boyte, R. M., Pilisuk, T., Matiella, A. C., & Macario, E. (2014). Developing a bilingual fotonovela to encourage human papillomavirus preteen immunization in California: A case study. *Californian Journal of Health Promotion*, *12* (3), 1–13.

Braddock, K. H., & Dillard, J. P. (2016). Meta-analytic evidence for the persuasive effect of narratives on beliefs, attitudes, intentions, and behaviors. *Communication Monographs*. *83*, 446–467. (Published online February 25, 2016). doi:10.1080/03637751.2015.1128555

Buisman, M., Allen, J., Fouarge, D., Houtkoop, W., & Van der Velden, R. (2013). *PIAAC: Kernvaardigheden voor werk en leven. Resultaten van de Nederlandse survey 2012*. 's-Hertogenbosch, Nederland: ECBO.

Busselle, R., & Bilandzic, H. (2008). Fictionality and perceived realism in experiencing stories: A model of narrative comprehension and engagement. *Communication Theory*, *18*, 255–280. doi:10.1111/j.1468-2885.2008.00322.x

De Graaf, A., Hoeken, H., Sanders, J., & Beentjes, J. W. J. (2012). Identification as a mechanism of narrative persuasion. *Communication Research*, *39*, 802–823. doi:10.1177/0093650211408594

De Graaf, A., Sanders, J., & Hoeken, J. A. L. (2016). Characteristics of narrative interventions and health effects: A review of the content, form, and context of narratives in health-related narrative persuasion research. *Review of Communication Research*, *4*, 88–131.

DeWalt, D. A., Berkman, N. D., Sheridan, S. L., Lohr, K. N., & Pignone, M. (2004). Literacy and health outcomes: A systematic review of the literature. *Journal of General Internal Medicine*, *19*, 1228–1239. doi:10.1111/j.1525-1497.2004.40153.x

Duizer, E., Koops van 't Jagt, R., & Jansen, C. (2014). Zoete verleiding: Een onderzoek naar de effecten van een fotoverhaal over diabetes bij laaggeletterden. *Tijdschrift voor Taalbeheersing*, *36*, 293–319. doi:10.5117/TVT2014.3.DUIZ

Fransen, M. L., Smit, E. G., & Verlegh, P. W. J. (2015). Strategies and motives for resistance to persuasion: An integrative framework. *Frontiers in Psychology*, *6*, 1201–1221. doi:10.3389/fpsyg.2015.01201

Geboers, B., Reijneveld, S. A., Jansen, C. J. M., & De Winter, A. F. (2016). Health literacy is associated with health behaviors and social factors among older adults: Results from the LifeLines Cohort Study. *Journal of Health Communication*, *21* (Sup 2), 45–53. doi:10.1080/10810730.2016.1201174

Gezondheidsraad. (2011). *Laaggeletterdheid te lijf: Signalering ethiek en gezondheid*. Den Haag, Nederland: Centrum voor ethiek en gezondheid.

Glaser, M., Garsoffky, B., & Schwan, S. (2009). Narrative-based learning: Possible benefits and problems. *Communications: The European Journal of Communication Research*, *34*, 429–447. doi:10.1515/COMM.2009.026

Green, M. C., & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology*, *79*, 701–721. doi:10.1037/0022-3514.79.5.701

Green, M. C., & Brock, T. C. (2002). In the mind's eye: Transportation-imagery model of narrative persuasion. In M. C. Green, J. J. Strange, & T. C. Brock (Eds.), *Narrative impact: Social and cognitive foundations* (pp. 315–341). Mahwah, NJ: Lawrence Erlbaum.

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford Publications.

Hinyard, L. J., & Kreuter, M. W. (2007). Using narrative communication as a tool for health behavior change: A conceptual, theoretical, and empirical overview. *Health Education and Behavior*, *34*, 777–792. doi:10.1177/1090198106291963

Hoeken, H., & Sinkeldam, J. (2014). The role of identification and perception of just outcome in evoking emotions in narrative persuasion. *Journal of Communication*, *64*, 935–955. doi:10.1111/jcom.2014.64.issue-5

James, S., Reddy, P. S., Ruiter, R. A. C., Taylor, M., Jinabhai, C. C., Van Empelen, P., & Van den Borne, B. (2005). The effects of a systematically developed photo-novella on knowledge, attitudes, communication and behavioural intentions with respect to sexually transmitted infections among secondary school learners in South Africa. *Health Promotion International*, *20*, 157–165. doi:10.1093/heapro/dah606

Kong, A., Tussing-Humphreys, L. M., Odoms-Young, A. M., Stolley, M. R., & Fitzgibbon, M. L. (2014). Systematic review of behavioural interventions with culturally adapted strategies to improve diet and weight outcomes in African American women. *Obesity Reviews*, *15* (Suppl. S4), 62–92. doi:10.1111/obr.2014.15.issue-s4

Koops van 't Jagt, R., Hoeks, J. C. J., Jansen, C. J. M., De Winter, A. F., & Reijneveld, S. A. (2016). Comprehensibility of health related documents for older adults with different levels of health literacy: A systematic review. *Journal of Health Communication*, *20*, 159–177.

Kreuter, M. W., Sugg-Skinner, C., Holt, C. L., Clark, E. M., Haire-Joshu, D., Fu, Q., … Bucholtz, D. (2005). Cultural tailoring for mammography and fruit and vegetable intake among low-income African-American women in urban public health centers. *Preventive Medicine*, *41*, 53–62. doi:10.1016/j.ypmed.2004.10.013

Larkey, L. K., & Hecht, M. J. (2010). A model of effects of narrative as culture-centric health promotion. *Journal of Health Communication*, *15*, 114–135. doi:10.1080/10810730903528017

Mar, R. A., & Oatley, K. (2008). The function of fiction is the abstraction and simulation of social experience. *Perspectives on Psychological Science*, *3*, 173–192. doi:10.1111/j.1745-6924.2008.00073.x

Meppelink, C. S., Smit, E. G., Buurman, B. M., & Van Weert, J. C. M. (2015). Should we be afraid of simple messages? The effects of text difficulty and illustrations in people with low or high health literacy. *Health Communication*, *30*, 1181–1198. doi:10.1080/10410236.2015.1037425

Moyer-Gusé, E. (2008). Toward a theory of entertainment persuasion: Explaining the persuasive effects of entertainment-education messages. *Communication Theory*, *18*, 407–425. doi:10.1111/comt.2008.18.issue-3

Moyer-Gusé, E., Jain, P., & Chung, A. H. (2012). Reinforcement or reactance? Examining the effect of an explicit persuasive appeal following an entertainment-education narrative. *Journal of Communication*, *62*, 1010–1027. doi:10.1111/j.1460-2466.2012.01680.x

Moyer-Gusé, E., & Nabi, R. L. (2010). Explaining the persuasive effects of narrative in an education entertainment television program: Overcoming resistance to persuasion. *Human Communication Research*, *36*, 26–52. doi:10.1111/j.1468-2958.2009.01367.x

Murphy, S. T., Frank, L. B., Chatterjee, J. S., Moran, M. B., Zhao, N., Amezola De Herrera, P., & Baezconde-Garbanati, L. A. (2015). Comparing the relative efficacy of narrative vs nonnarrative health messages in reducing health disparities using a randomized trial. *American Journal of Public Health*, *105*, 2117–2123. doi:10.2105/AJPH.2014.302332

Nierkens, V., Hartman, M. A., Nicolaou, M., Vissenberg, C., Beune, E. J., Hosper, K., … Stronks, K. (2013). Effectiveness of cultural adaptations of interventions aimed at smoking cessation, diet, and/or physical activity in ethnic minorities: A systematic review. *PLoS One*, *8*, e73373. doi:10.1371/journal.pone.0073373

Parker, R. M., Baker, D. W., Williams, M. V., & Nurss, J. R. (1995). The test of functional health literacy in adults: A new instrument for measuring patents' literacy skills. *Journal of General Internal Medicine*, *10*, 537–541. doi:10.1007/BF02640361

Schank, R. C., & Abelson, R. P. (1977). *Scripts, plans, goals and understanding: An inquiry into human knowledge structures*. Hillsdale, NJ: L. Erlbaum.

Schank, R. C., & Abelson, R. P. (1995). Knowledge and memory: The real story. In R. S. Wyer Jr. (Ed.), *Knowledge and memory: The real story* (pp. 1–85). Hillsdale, NJ: L. Erlbaum Associates.

Schillinger, D., Barton, L. R., Karter, A. J., Wang, F., & Adler, N. (2006). Does literacy mediate the relationship between education and health outcomes? A study of a low-income population with diabetes. *Public Health Reports*, *121*, 245–254.

Schillinger, D., Grumbach, K., Piette, J., Wang, F., Osmond, D., Daher, C., … Bindman, A. B. (2002). Association of health literacy with diabetes outcomes. *JAMA (Journal of the American Medical Association)*, *288*, 475–482. doi:10.1001/jama.288.4.475

Singhal, A., Njogu, K., Bouman, M., & Elias, E. (2006). Entertainment-education and health promotion: A cross-continental journey. In A. Singhal & J. W. Dearing (Eds.), *Communication of innovations: A journey with Ev Rogers* (pp. 199–229). Thousand Oakes, CA: Sage.

Singhal, A., & Rogers, E. (1988). Television soap operas for development in India. *International Communication Gazette*, *41*, 109–126. doi:10.1177/001654928804100203

Slater, M. D., & Rouner, D. (2002). Entertainment-education and elaboration likelihood: Understanding the processing of narrative persuasion. *Communication Theory*, *12*, 173–191.

Unger, J. B., Cabassa, L. J., Molina, G. B., Contreras, S., & Baron, M. (2013). Evaluation of a fotonovela to increase depression knowledge and reduce stigma among Hispanic adults. *Journal of Immigrant and Minority Health*, *15*, 398–406. doi:10.1007/s10903-012-9623-5

Unger, J. B., Molina, G. B., & Baron, M. (2009). Evaluation of *Sweet Temptations*, a Fotonovela for Diabetes Education. *Hispanic Health Care International*, *7*, 145–152. doi:10.1891/1540-4153.7.3.145

White, S., & Dillow, S. (2005). *Key concepts of the 2003 national assessment of adult literacy*. Washington, DC: NCES.

Zabrucky, K. M., & Moore, D. (1999). Influence of text genre on adults' monitoring of understanding and recall. *Educational Gerontology*, *25*, 691–710. doi:10.1080/036012799267440